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ABSTRACT

One way to minimize the test taking advantage that test-wise students have is to offer all students the opportunity to become test-wise through formal instruction in test taking. This paper describes the development and use of "Form Z," a test that can be used as a teaching aid or as a research instrument for test wiseness. The test was designed to use language understood by high school and college students, to be completed in one class period, to have a reliability coefficient of .80, to measure several aspects of test-wiseness, and to be self administering. The 46 items in Form Z demonstrate the applications of ten test-wise strategies, five that deal with deductive reasoning and five that deal with subsuming cues within the questions or test items. Descriptions and illustrations of each strategy are provided, as well as suggested applications of the test. A copy of Form Z is attached. (RL)

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DEVELOPMENT AND USE OF A TEST OF TEST-WISENESS

George Ferrell

Question: The Webster-Ashburton Treaty settled a long-standing dispute between Great Britain and the United States over

a. the Maine boundry.
b. numerous contested claims to property as well as many other sources of ill-will.
c. damages growing out of the War of 1812 and subsequent events.
d. fishing rights on the Great Lakes and in international waters.

If you selected option one you made the test-wise response. Test-wiseness is the ability to correctly answer test questions on some basis other than knowledge the questions were designed to measure. If luck and subject matter knowledge are held constant, the student high in test-wiseness will answer more items correctly than the student low in test-wiseness and will do so by employing cues in the test items or characteristics of the test taking situation (3). Therefore, some students will receive higher scores on their tests only because of an ability to take test which is not related to the abilities the instructor wanted to measure.

The literature on test construction offers item writing principles for foiling the test-wise answer. Unfortunately teachers,

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especially on the college level, have little if any training in the application of these principles. Therefore, their tests are particularly vulnerable to the effects of test-wiseness since they tend to be informally written and given in comparison to standardized tests constructed by specialists. It is impracticable for all teachers to learn and apply the item writing principles which foil the test-wise response. Our best chance for minimizing the advantage of the test-wise students is to offer all students the opportunity to become test-wise through formal instruction in test taking.

Millman, Bishop, and Ebel (3) have compiled a thorough outline of test-wiseness principles in which they list 33 different test taking strategies, divided into six major catagories. The strategies in three of the catagories can be applied in all testing situations and these include strategies for using time, avoiding errors, and considering the intent of the test maker. Applying principles in the fourth catagory, guessing strategies, may or may not benefit a student depending on how the test is scored. The two remaining catagories of strategies are deductive reasoning and cue-using and the possible application of these strategies is determined by the quality of the items in the test.

This paper describes the development and use of a test of test-wiseness which is applicable in both the teaching and research setting.

Development of Test Of Test-wiseness

I set as an objective to either locate a test of test-wiseness or develop one. The final test would have to meet five criteria: 1) the difficulty of the language used in the items had to be appropriate for use with students in high school and community

colleges, 2) within reason all students should be able to complete the test of test-wiseness within a normal academic class period of 45 to 50 minutes, 3) the test must have a reliability coefficient approaching .80, 4) the test should measure as many aspects of test-wiseness as possible within the time limit restriction, and 5) the test must be appropriate for use as both a teaching and research tool.

A search of the literature revealed tests of test-wiseness but none which met all the criteria. I decided to construct a test and began by compiling a pool of possible items from previously constructed tests of test-wiseness (2,4,5,6). Two preliminary forms were constructed and administered to community college and high school samples. With data from these preliminary administrations a final form of a test of test-wiseness was constructed, Form Z. Form Z has since been administered to high school, community college, and university students.

Use Of Form Z

Since its development the Form Z test of test-wiseness has been successfully used as a teaching tool in learning resource centers, learning skills workshops, test anxiety treatment groups, and high school classrooms. Form Z has also been used for research purposes (1).

Form Z is self administering so it can be distributed one day as homework to be discussed the next day. It is also quite effective to allow the students to work on Form Z as soon as it is distributed. The items become a series of puzzles which stimulate discussion, often small groups of students spontaneously form as items are one by one discussed and compared. The exercise is stimulating and fun for the students.

After 40 minutes or so the students can be formed into a large group for discussing the answers to Form Z. Students are given a brief introductory lecture on the topic of test-wiseness which includes a definition for test-wiseness, an explanation of how test-wiseness can be increased by applying 10 different answering strategies, and an explanation of how these strategies will be identified and learned during the upcoming discussion period.

The instructor might at this time want to distribute a handout to the students containing the 10 principles illustrated by the items in Form Z. Such a handout could be made from the final section of this paper or from a copy of the "Outline of Test-Wiseness Principles" by Millman et al. (3). Another successful alternative has been to develop the 10 principles on the chalk board.

The answers to the items on Form Z are the framework for the large group discussion. The student's interests determine which items are considered and in what sequence. The instructor's primary function is to help students understand the 10 general strategies applicable to Form Z. It has been easy to maintain a lively, fun atmosphere for this instruction.

Following discussion of the Form Z items a teacher could stop and consider the teaching unit to be completed and move on to a distantly related topic. On the other hand a teacher could use the Form Z scoring exercises as a bridge into other topics on test taking. The exercise elicits topics easily extended into time use and other strategies not measured by Form Z, preparations for taking tests, and strategies for taking essay tests.

Description Of Form Z

The Form Z test of test-wiseness is composed of 46 items intended to measure 10 different test-wise strategies. A KR-20 reliability coefficient of .80 was obtained from 110 eleventh-grade students. The directions for the test are simple enough to make the test self administering and the working time is 40 minutes.

The remainder of this paper is a listing of the 10 principles of test-wiseness measured in Form Z and originally stated in the outline by Millman et al. (3). Accompanying each principle is an illustrative item from Form Z with the correct option underlined. The first five principles are deductive reasoning strategies and the second five are cue-using strategies.

Deductive Reasoning Strategies

(1) The first strategy is to eliminate options which are known to be incorrect and choose from among the remaining options.

Example 1: Mount Reid is a mountain peak in the

a. Klondike Range.

b. Great Plains.

c. Sahara Desert.

d. Canadian Prairie.

(2) If option A of an item implies the correctness of option B, then choose neither options A nor B or both options A and B.

Example 2: The stridule principle of arithmetic is useful when you

a. add.

b. divide.

c. sum.

d. total.

(3) If statement A implies the incorrectness of statement B, choose statement A or B but not both A and B. Items like the next example had directions to select the two or more correct options.

Example 3: At the battle of Munda

a. an airfield was captured.

b. a submarine base was occupied.

c. Napoleon was victorious.

(4) If statements A and B are known to be correct, select the option which includes both A and B.

Example 4: The heart 1. pumps blood.

2. alternately contracts and expands.

3. is marked by the suleus intercuralis.

4. possesses the Bundle of His.

a. 1

b. 2 and 4

c. 1 and 3

d. 1 and 2 and 4

(5) The last deductive reasoning strategy is to answer items based on information gathered from other items. The cue for this example item is given in the item which begins this paper.

Example 5: The dispute between Great Britain and the United States over the boundary of Maine was settled by

a. the Treaty of Quebec.

b. the Treaty of Niagara.

c. the Webster-Ashburton Treaty.

d. the Pendleton-Scott Treaty.

Cue-Using Strategies

The first three cue-using strategies are subsumed under the general principle of recognizing the correct option by the way it is written differently from the incorrect options.

(1) The first way a test maker can indicate the correct option in an item is to make it longer or shorter than the incorrect options.

Example 6: William Wordsworth

a. wrote 43 novels.

b. was an early French poet.

c. was one of the earliest great and well-known English Romantic poets.

d. served under Julius Caesar.

(2) The second way of cuing the correct option is to make it more finely qualified or to make it represent a higher degree of generalization. The example just given for the above strategy is equally appropriate for this second cue-using strategy and so is the item which begins this paper.

(3) The third type of cue to the correct option is to not make it grammatically inconsistent with the stem.

Example 7: The point nearest the earth in the orbit of the moon is a

a. estival.

b. equinox.

c. perigee.

d. umbo.

(4) The fourth method is to recognize the cue for the correct option by identifying and comparing specific determiners.

Example 8: In the Tepis Islands, men

a. always live to be more than 60 years old.

b. never outlive their wives.

c. sometimes live to be over 100 years old.

d. never live to be more than 40 years old.

(5) The last strategy is to recognize a cue for the correct option in the way one of the options shares some aspect with the stem.

Example 9: The leaves of the silver-leaf polus tree

a. are arranged in pairs on the stem.

b. are large and oval shaped.

c. appear to have smooth edges.

d. appear to shine in the sun.

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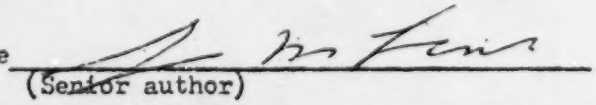
Signature 
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Directions:

This is a test of test-wiseness which measures abilities needed to do well on tests. Many of the questions are about things that you have not studied. The test-wise person is able to figure out what to do when faced with such questions.

Each of the questions or unfinished sentences in the test is followed by four choices. You are to pick the one that best answers the question or finishes the sentence. For each item circle the number of the option you think is correct.

Answer all problems even if you are not sure of the answer. If you change your mind about an answer, erase your first mark completely. Remember, answer all problems.

1. On his death bed, Napoleon Bonaparte is reported to have said: "The English had too many

   1. machine guns."
   2. cross-bows."
   3. spears."
   4. cannons."

2. The greatest advantage of using slent in the manufacture of steel is that slent makes the steel

   1. transparent.
   2. stainless.
   3. heavy.
   4. bulky.

3. The point farthest from the earth in the orbit of the moon is an

   1. perigee.
   2. apogee.
   3. maximum.
   4. contour.

4. Which of the following has (have) square roots which are whole numbers?

   a. 4
   b. 9
   c. 436920
   d. 373322

   1. a
   2. c and d
   3. a and b
   4. b and c and d

5. Which of the following best describes the climate of the Kulu Valley?

   1. Some snow occasionally falls during the months of October and November.
   2. The temperature never rises above 60 degrees Fahrenheit.
   3. There is absolutely no vegetation in the valley.
   4. Heavy rainfall always occurs each day in the month of January.

6. Which of the following most likely caused the War of 1693?

   1. Spain was building roads to connect her cities.
   2. France was going through great agricultural change.
   3. France believed that Spain was increasing her troops.
   4. Spain had a series of earthquakes.

7. The disputed Hayes-Tilden election of 1876 was settled by an

   1. joint resolution of Congress.
   2. resolution of the House of Representatives.
   3. decision of United States Supreme Court.
   4. Electoral Commission.

8. The Flying Spider is known for its ability to

   1. blend in with its surroundings.
   2. glide through the air.
   3. kill its prey with poison.
   4. make very large webs.

9. The stridule principle of arithmetic is useful when you

1. add.
2. divide.
3. sum.
4. total.

10. The Locarno Pact

1. is an international agreement for the maintenance of peace through the guarantee of national boundaries of France, Germany, Italy, Belgium and other countries of western Europe.
2. allowed France to occupy the Ruhr Valley.
3. provided for the dismemberment of Austria-Hungary.
4. provided for the protection of Red Cross bases during war times.

11. Robert Louis Stevenson wrote

a. Treasure Island.
b. Weir of Hermiston.
c. Great Western.
d. The Narrative of Arthur Gordon Pym.

1. a and b
2. b and d
3. c and d
4. b and c and d

12. William Wordsworth

1. wrote 43 novels.
2. was an early French poet.
3. was one of the earliest great and well-known English Romantic poets.
4. served under Julius Caesar.

13. Early Deosophus Man

1. killed small animals only by throwing sharp stones.
2. never hunted in groups.
3. always lived in dense forest areas.
4. sometimes lived in tribes.

14. Mount Reid is a mountain peak in the

1. Klondike Range.
2. Great Plains.
3. Sahara Desert.
4. Canadian Prairie.

15. A horse

    1. is classified as an amphibian.
    2. has a subdivided stomach.
    3. is classified in zoological terms as both a mammal and a vertebrate.
    4. is a meat-eater.

16. A major treaty, signed in 1925, guaranteeing the boundaries of Germany and six allied nations in Western Europe was

    1. The Treaty of Versailles.
    2. The Locarno Pact.
    3. The Ostend Manifesto.
    4. The Entente Cordiale.

17. Organisms of the Pavo genus

    1. change from masculine to feminine gender.
    2. display their plumage for the female.
    3. become female after existing for a period of time as male.
    4. possess an excess quantity of masculine hormone.

18. "The Salad" is a fairy tale by

    1. Percy Bysshe Shelley.
    2. the Brothers Grimm.
    3. George Meredith.
    4. John Donne.

19. In Horace Walpole's The Castle of Otranto

    1. Manfred is the father of Hippolita.
    2. Hippolita is the wife of Manfred.
    3. Manfred is the uncle of Hippolita.
    4. Hippolita is the daughter of Manfred.

20. The wars that Thucydides, the historian, wrote a history of were

    1. the Peloponnesian Wars.
    2. the Persian War.
    3. the March of the Ten Thousand.
    4. the conquest of Egypt by Alexander the Great.

21. Dictators who have ruled countries in the twentieth century include

    a. Fidel Castro
    b. Adolph Hitler
    c. Manuel Herrera
    d. Anastazio Samoza

    1. a
    2. a and b and d
    3. a and c and d
    4. b and c and d

22. In the Tepsis Islands, men

    1. always live to be more than 60 years old.
    2. never outlive their wives.
    3. sometimes live to be over 100 years old.
    4. never live to be more than 40 years old.

23. The career of Marius (155-86 B.C.), the opponent of Sulla, is significant in Roman history because

    1. he gave many outstanding dinners and entertainments for royalty.
    2. he succeeded in arming the gladiators.
    3. he showed that the civil authority could be thrust aside by the military.
    4. he made it possible for the popular party to conduct party rallies outside the city of Rome.

24. The first presidential election dispute in the United States to be settled by an appointed Electoral Commission was

    1. the Hayes-Tilden election.
    2. the Jefferson-Madison election.
    3. the John Quincy Adams-Henry Clay election.
    4. the Garfield-McKinley election.

25. The best reason for watering your lawn with brionic solution is that it

    1. can be stored for several seasons without losing its usefulness.
    2. is not harmful to weeds.
    3. can readily be produced in large quantities.
    4. helps the lawn to withstand the hot sun.

26. Charles Dickens' Hard Times deals with

    1. the difficult life of a factory worker.
    2. the politics of the French chateau country.
    3. the court of King Edward III.
    4. the limitations of European existentialism.

27. The Webster-Ashburton Treaty settled a long-standing dispute between Great Britain and the United States over

1. the Maine boundary.
2. numerous contested claims to property as well as many other sources of ill-will.
3. damages growing out of the War of 1812 and subsequent events.
4. fishing rights on the Great Lakes and in international waters.

28. The leaves of the silver-leaf polus tree

1. are arranged in pairs on the stem.
2. are large and oval shaped.
3. appear to have smooth edges.
4. appear to shine in the sun.

29. Which of the following were English authors?

a. William Shakespeare
b. Charles Dickens
c. John Skelton
d. Arthur Paul

1. a
2. c
3. b and c
4. a and b and c

30. An ancient Greek coin is a

1. icon.
2. escudo.
3. drachma.
4. eulalia.

31. The Fisher Act, legislated by Parliament,

1. reformed "rotten boroughs."
2. established a national system of public education with tax-supported, public elementary and secondary schools.
3. reduced the power of the House of Lords.
4. created a system of socialized medicine.

32. The Locarno Pact

1. was an agreement between Greece and Turkey.
2. gave the Tyrol to Italy.
3. was a conspiracy to blow up the League of Nations' building at Locarno.
4. guaranteed the boundary arrangements in western Europe.

33. When a number is multiplied by its transform, the product is

1. larger than the original number.
2. greater than the original number.
3. smaller than the original number.
4. more than the original number.

34. The Japanese game of paduki

1. can only be played by the Imperial Family.
2. is sometimes played indoors.
3. can never be played for more than 30 minutes.
4. is always played at every celebration.

35. The Alveolar sacs are concerned with

1. oxygen uptake and carbon dioxide exhalation.
2. implantation of embryos and digestion of carbohydrates.
3. reception of sensory stimuli and the growth of hair.
4. synthesis of sugar and classification of the specie.

36. The heart

a. pumps blood.
b. alternately contracts and expands.
c. is marked by the suleus intercuralis.
d. possesses the Bundle of His.

1. a
2. b and d
3. a and c
4. a and b and d

37. The dispute between Great Britain and the United States over the boundary of Maine was settled by

1. the Treaty of Quebec.
2. the Treaty of Niagara.
3. the Webster-Ashburton Treaty.
4. the Pendleton-Scott Treaty.

38. Giles Fletcher

1. is best known for a long allegorical poem, although he also wrote prose.
2. preached in the Cathedral of Saint John the Divine, in London.
3. wrote "A Fair and Happy Milkmaid" and "Autumn's Bliss."
4. was engaged to Mary Blake, but fled to France to escape marriage.

39. The American novel "The Conflict," written by Thomas Selton, describes

    1. the East-West War.
    2. the war between the North and the South from 1861 to 1865.
    3. the war between the States.
    4. the Civil War.

40. The point nearest the earth in orbit of the moon is a

    1. estival.
    2. equinox.
    3. perigee.
    4. umbo.

41. In Roman history, a very famous political controversy developed around the relative power of the civil as opposed to the military components of government. Sulla defended the position that the civil authority was supreme. His opponent, who favored military authority, was

    1. Cicero.
    2. Marius.
    3. Phidias.
    4. Polybius.

Unlike the previous questions, each question below has AT LEAST 2 correct answers. For each item circle two or more of the numbers preceding the options.

To get the item right you must circle all the correct options and leave uncircled all the incorrect options. Each item is considered either entirely all correct (1 point) or--if any part is wrong--entirely all incorrect (0 points). NO PARTIAL CREDIT.

ANY ANSWER IN WHICH ONLY ONE OPTION IS CIRCLED IS AUTOMATICALLY WRONG

Example: Which of the following are cities in the United States?

(1.) Los Angeles
(2.) Chicago
3. South Dakota
(4.) Detroit

42. At the battle of Munda

1. an airfield was captured.
2. a submarine base was occupied.
3. Napoleon was victorious.

43. The narrator of George P. Elliott's "Among the Dangs"

1. is able to live among a warlike primitive tribe because he is a Negro.
2. cannot escape to the land in which he was raised.
3. is unable to free himself to return to the country where he grew up.
4. due to his being colored, can dwell with a band of savages.

44. The graph of $z = \frac{8a^3}{X^2 + 4a^2}$ $(a > 0)$ is

1. a smooth unbroken curve.
2. a discontinuous broken curve.
3. called the "Witch of Agnesi."
4. given no special name.

45. Homer W. Smith's Kamongo

1. takes place aboard a steamship.
2. consists largely of a discussion between a physiologist and an Anglican priest.
3. shows the life of a jester in fifteenth century France.

46. Nemachilus barbatulus

1. is found only on land.
2. swims by means of fins.
3. is found in an environment relatively free of salt.
4. lives in a region of high salt concentration.